

EDWARD H. RICHARDSON ASSOCIATES, INC.

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COMM. No.: 1233-47-2

JANUARY 26, 1976

NEW CASTLE COUNTY
DEPT. OF PUBLIC WORKS
2701 CAPITOL TRAIL
NEWARK, DE 19711

RECEIVED JAN 28 1976

ATTENTION: MR. DAVID CLARK

RE: TYBOUTS CORNER LANDFILL
INTERIM REPORT NO. 5
GROUNDWATER MONITORING

GENTLEMEN:

IN ACCORDANCE WITH THE MONITORING PROGRAM ESTABLISHED FOR THE TYBOUTS CORNER LANDFILL, WE HAVE MEASURED GROUNDWATER LEVELS ON JANUARY 21, 1976. A SUMMARY OF THESE DATA ARE ENCLOSED.

COMPARISON OF THESE DATA WITH SIMILAR DATA FROM DECEMBER 10, 1975, INDICATE A GENERAL RISE IN THE RECORDED WATER LEVELS, DURING THE INTERVENING SIX (6) WEEK PERIOD, WITH TWENTY-FIVE (25) MONITORS SHOWING AN INCREASE, WHICH AVERAGED APPROXIMATELY 0.3 FEET, FOUR (4) MONITORS SHOWING A DECREASE, WHICH AVERAGED APPROXIMATELY 0.25 FEET, AND THREE (3) REMAINING UNCHANGED. WITHIN THE BODY OF THE LANDFILL PROPER, THE CENTRAL AND NORTHWESTERN PORTIONS OF THE SITE SHOWED THE GREATEST INCREASE, AVERAGING APPROXIMATELY 0.4 FEET, WHILE THE EASTERN THIRD (1/3) OF THE SITE REMAINED ESSENTIALLY UNCHANGED.

MONITORING AT TYBOUTS HAS BEEN ONGOING FOR A SUFFICIENT TIME TO ALLOW COMPARISON ON A YEARLY AND SEASONAL BASIS. THE FOLLOWING TABLE SHOWS THE CHANGES IN RECORDED WATER LEVELS AS COMPARED TO DATA FOR JANUARY 23, 1975. THESE DATA INDICATE A SIGNIFICANT VARIATION DURING THE PAST YEAR, RANGING FROM AN INCREASE OF 1.7 FEET (MP-1) TO DECREASE OF 1.6 FEET (MP-13). ALL TOTALLED, SEVENTEEN (17) MONITORS INDICATED AN INCREASE IN WATER LEVELS, TWELVE (12) A DECREASE AND TWO (2) WERE UNCHANGED. IN SPITE OF THE APPARENT RANDOM VARIATION IN THE WATER LEVEL DATA, EVALUATION, BASED ON MONITOR LOCATION, INDICATES A GEOGRAPHIC TREND TO WATER LEVEL VARIATION. IN GENERAL, THE EASTERN AND CENTRAL THIRDS OF THE SITE SHOW AN INCREASE, WHICH RESPECTIVELY AVERAGED IN EXCESS OF

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OF ONE (1) FOOT AND APPROXIMATELY 0.3 FEET. HOWEVER, THE WESTERN THIRD (1/3) OF THE SITE SHOWED A GENERAL DECREASE IN WATER LEVELS, AVERAGING APPROXIMATELY A HALF (1/2) FOOT, AS DID THE MONITORS SITUATED WEST OF PIGEON RUN. THIS DECREASE IN WATER LEVELS OCCURRED IN SPITE OF 49.61 INCHES OF RAINFALL FOR THE 1975 CALENDAR YEAR, WHICH IS APPROXIMATELY SIX (6) INCHES ABOVE NORMAL. THIS DECREASING TREND, OUTSIDE OF THE FILL AREA, MAKES THE INCREASING TREND WITHIN THE FILL MORE CONSPICUOUS.

MEASURED DIFFERENCES
WATER LEVEL ELEVATION

<u>MONITOR*</u>	<u>ELEVATION</u>	<u>MONITOR*</u>	<u>ELEVATION</u>	<u>MONITOR*</u>	<u>ELEVATION</u>
P-1	+1.6 FT.	MP-6	+0.7 FT.	MP-18	-0.5 FT.
P-3	+0.4 FT.	MP-7	-0.7 FT.	MP-18A	+0.8 FT.
P-5	-0.1 FT.	MP-8	- - -	MP-19	-0.9 FT.
P-6	+1.6 FT.	MP-9	- - -	MP-20	-0.5 FT.
		MP-10	+0.2 FT.	MP-21	-0.9 FT.
MP-1	+1.7 FT.	MP-11	+0.4 FT.	MP-23	+0.1 FT.
MP-2	+0.4 FT.	MP-12	-0.5 FT.	MP-24	0.0 FT.
MP-3	+0.5 FT.	MP-13	-1.6 FT.	MP-26	- - -
MP-3A	+0.3 FT.	MP-14	+0.3 FT.	MP-27	+1.2 FT.
MP-4	+1.5 FT.	MP-15	- - -	MP-28	-0.5 FT.
MP-5F	+0.4 FT.	MP-16	-0.7 FT.	MP-29	0.0 FT.
MP-5G	+1.3 FT.	MP-17	-1.1 FT.	MP-30	-0.1 FT.

* FOR MONITOR LOCATION SEE "LOCATION PLAN" CONTAINED IN THE
PHASE II REPORT DATED NOVEMBER 13, 1974.

THE REGION, WHERE THE INCREASING WATER LEVEL IS MORE PROMINENT, IS COINCIDENT WITH THE LEACHATE SOURCE AREA, DESIGNATED IN THE PHASE II REPORT, DATED NOVEMBER 13, 1974. IT MUST BE ASSUMED, THEREFORE, THAT ON THE BASIS OF THE INCREASE VOLUME OF TRASH IN CONTACT WITH GROUNDWATER, THAT THE VOLUME RATE OF LEACHATE PRODUCTION HAS INCREASED OVER THE PAST YEAR. THIS INCREASE, COUPLED WITH THE INCREASE IN THE WATER-TABLE GRADIENT ACROSS THE SITE FROM EAST TO WEST, INDICATES THAT THE VOLUME OF LEACHATE REACHING PIGEON RUN HAS PROBABLY ALSO INCREASED DURING THIS PERIOD. THIS POSSIBILITY IS SUPPORTED BY FIELD OBSERVATIONS OF INCREASED LEACHATE BEEP ACTIVITY, REPORTED IN OUR LAST TWO (2) INTERIM REPORTS, DATED DECEMBER 17 AND NOVEMBER 10, 1975.

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WE MUST AGAIN EMPHASIZE THAT THESE DATA AND TRENDS INDICATE THAT THE LANDFILL MAY BE IN THE EARLY STAGES OF A POTENTIAL PROBLEM, AND RECOMMEND THAT THE PROGRAM, SUGGESTED IN OUR LAST INTERIM REPORT, BE IMPLEMENTED SO THAT THE MAGNITUDE OF THIS PROBLEM MAY BE ACCESSED MORE QUANTITATIVELY. TO DATE, WE HAVE RECEIVED NO CORRESPONDENCE FROM YOUR OFFICE INDICATING THE COUNTY'S DESIRES WITH REGARD TO THE SURFACE WATER SAMPLING PROGRAM, WHICH WE HAD RECOMMENDED.

WE HAVE TENTATIVELY SCHEDULED THE NEXT ROUND OF WATER LEVEL MEASUREMENTS FOR THE FIRST WEEK IN MARCH. AT THAT TIME, IT IS OUR INTENTION TO OBTAIN GROUNDWATER SAMPLES FOR QUALITY ANALYSIS. IF THE COUNTY IS AGREEABLE, WE COULD ALSO OBTAIN SURFACE WATER SAMPLES AT THE SAME TIME; THUS, PROVIDING A SYNOPSIS VIEW OF THE ENTIRE TYDOUTS SITUATION.

WE WOULD APPRECIATE RECEIVING YOUR AUTHORIZATION TO PROCEED WITH THE REVISIONS TO THE MONITORING PROGRAM, AS OUTLINED IN OUR DECEMBER 17, 1975 REPORT.

IF YOU HAVE ANY QUESTIONS REGARDING THE ABOVE, PLEASE DO NOT HESITATE TO CONTACT US.

VERY TRULY YOURS,

EDWARD H. RICHARDSON ASSOCIATES, INC.

Glenn K. Elliott

GLENN K. ELLIOTT

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ENCLOSURES

1. WATER LEVEL MEASUREMENT TABLE
2. COPY OF DECEMBER 17, 1975 INTERIM REPORT.

CC: MR. A. W. MADORA
MR. J. F. DUFFIELD

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GROUNDWATER ELEVATION
AT
TYBOUTS CORNER LANDFILL

MONITOR
NUMBER

1-21-76

P-1	39.0 FT.	
P-2		----- MONITOR DESTROYED -----
P-3	31.4 FT.	
P-5	30.5 FT.	
P-7	40.2 FT.	

P-1	40.4 FT.
P-2	36.4 FT.
P-3	33.8 FT.
P-3A	33.8 FT.
P-4	36.8 FT.

1P-5F	24.9 FT.
1P-5G	39.9 FT.
1P-6	6.1 FT.
1P-7	28.8 FT.
1P	24.4 FT.

4P-10	27.4 FT.
4P-11	32.1 FT.
4P-12	36.5 FT.
4P-13	25.2 FT.
4P-14	30.9 FT.

4P-15		----- MONITOR DESTROYED -----
4P-16	12.1 FT.	
4P-17	15.2 FT.	
4P-18	26.9 FT.	
4P-18A	33.6 FT.	

MP-19	5.7 FT.
MP-20	8.8 FT.
MP-21	6.2 FT.
MP-23	3.0 FT.
MP-24	3.5 FT.

MP-26	36.0 FT.
MP-27	37.2 FT.
MP-28	4.7 FT.
MP-29	16.8 FT.
MP-30	24.7 FT.

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